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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/238,136	01/27/1999	DEEPEN SINHA	12-38	6686

7590 05/28/2003
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EXAMINER

HARPER, V PAUL

ART UNIT	PAPER NUMBER
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2654

DATE MAILED: 05/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/238,136

Applicant(s)

SINHA ET AL.

Examiner

V. Paul Harper

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The Examiner has considered the references listed in the Information Disclosure Statement dated 1/27/99. A copy of the Information Disclosure Statement is attached to this office action.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

2. Claims 1-5, 7-14, 16-20 are rejected under 35 U.S.C. 102(e) as being anticipated by Smyth et al. (US Patent 5,956,674), hereinafter referred to as Smyth.

Regarding claims 1 and 10, Smyth discloses a multi-channel audio coder using psychoacoustic adaptive bit allocation. The method of Smyth's coder performs the following steps: determining the respective needs for the current frame of each channel (col. 6, Ins. 30-35), which corresponds to "determining a value of a criticality measure for each of at least a subset of the programs"; and dynamically allocating the required number of bits based on the determined needs of each channel where needs can vary between channels (col. 6, Ins. 56-65), which corresponds to "allocating available bits to the programs based at least in part on the values of the criticality measures, such that a

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program with a criticality measure having a particular value in a designated time interval is allocated a different percentage of the available bits for that interval than another one of the programs with a criticality measure having a different value.”

Regarding claims 2 and 11, Smyth teaches everything claimed, as applied above (see claims 1 and 10, respectively); in addition, Smyth teaches that the current program provides a multi-channel *audio* coder with the flexibility to accommodate a wide range of compression levels (col. 3, Ins. 12-20), which corresponds to “wherein at least a subset of the plurality of programs are audio programs.”

Regarding claims 3 and 12, Smyth teaches everything claimed, as applied above (see claims 1 and 10, respectively). In addition, Smyth teaches that the system has multiple encoders each corresponding to a channel with the output of each encoder going to a multiplexer (Fig. 2, col. 6, Ins. 55-65), which corresponds to “each of the encoders encodes a corresponding one of the programs, and generating an actual bit allocation for each of the plurality of encoders.”

Regarding claims 4 and 13, Smyth teaches everything claimed, as applied above (see claims 3 and 12, respectively). In addition, Smyth teaches the following for each channel: an encoder adaptively allocates available bits according to respective (psychoacoustic) needs to optimize coding efficiency (col. 6, Ins. 30-35), which corresponds to “(i) an actual bit demand for perceptual coding of the audio information of the given program in a designated time interval”; and according the respective needs, the bit allocation unit allocates bits (col. 6, Ins. 55-65), which corresponds to “(ii) a value of the criticality measure as determined for the designated time interval.”

Regarding claims 5 and 14, Smyth teaches everything claimed, as applied above (see claims 1 and 10, respectively). In addition, Smyth teaches the calculation of subband prediction modes to improve coding efficiency (col. 17, Ins. 1-30), which corresponds to "determining a value of a criticality flag for each of the programs."

Regarding claims 7 and 16, Smyth teaches everything claimed, as applied above (see claims 5 and 14, respectively). In addition, Smyth teaches the use of a predictor mode (PMODE) to indicated whether a subband will have any prediction signal coefficient vector address associated with its coded audio data block affecting compression and quality (col. 14, Ins. 50-56, col. 17, Ins. 30-37), which corresponds to "at least one of the criticality flags is a linear criticality flag having a value characterizing a designated quality of the corresponding program."

Regarding claims 8 and 17, Smyth teaches everything claimed, as applied above (see claims 7 and 16, respectively). In addition, Smyth teaches that the coder can take advantage of disparate signal demands (requiring more or less complexity in the coding) by the use of TMODE (transient mode) and PMODE (col. 5, Ins. 38-52, col. 7, Ins. 4-10, col. 14, Ins. 37-60), which corresponds to "the linear criticality flag can take on one of at least three possible values, including a first value indicating stationary low-complexity audio, a second value indicating stationary higher-complexity audio, and a third value indicating presence of at least one of an onset or transient."

Regarding claims 9 and 18, Smyth teaches everything claimed, as applied above (see claims 1 and 10, respectively). In addition, Smyth teaches the processing of a sequence of audio frames (col. 3, Ins. 20-22) including the allocation of bits for each

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subframe within the current frame inherently requiring repeated processing (col. 3, Ins. 38-45), which corresponds to "determining and allocating steps are repeated for each of a plurality of frames of information bits.

Regarding claims 19 and 20, these claims contain limitations similar to those found in claim 1 and are rejected for the same reasons.

3. Claims 6 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smyth in view of well known prior art (MPEP 2144.03).

Regarding claims 6 and 15, Smyth teaches everything claimed, as applied above (see claims 5 and 14, respectively). In addition, Smyth teaches the use of transient mode indexes (TMODE and THUFF, col. 14, Ins. 50-55, Table in cols. 31 and 32, col. 39, Ins. 15-23), which corresponds to "at least one of the criticality flags ... the value of which indicates the presence or absence of at least one of an onset and a transient in the corresponding program." But Smyth does not specifically teach that the criticality flag "is a single-bit criticality flag." However, the examiner takes official notice of the fact that the use of single-bit flag for the purpose of indicating one of two possible states was well known in the art.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Smyth such that a one-bit flag was used to indicate a change of state, to reduce the data size requirements.

Citation of Pertinent Art

4. The following prior art made of record but not relied upon is considered pertinent to the applicant's disclosure:

- a. Herre et al. (US Patent 6,424,939) teaches a method for encoding an audio signal using a psychoacoustic model.
- b. Hu (US Patent 6,128,593) teaches a method for implementing a refined psychoacoustic modeler using a bit allocator.
- c. Johnston et al. (US Patent 5,488,665) discloses a multi-channel perceptual audio compression system.
- d. Tae (US Patent 5,909,467) teaches a method for encoding and decoding a digital audio signal including a discussion of bit allocation to minimize transmitted parameters.
- e. Srinivasan et al. ("High-Quality Audio Compression Using an Adaptive Wavelet Packet Decomposition and Psychoacoustic Modeling," *IEEE Transactions on Signal Processing*, April 1998) teaches bit allocation using psychoacoustic modeling.

Conclusion

Any response to this office action should be mailed to:

Commissioner of Patents and Trademarks
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or faxed to:

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(703) 872-9314

Hand-delivered responses should be brought to:

Crystal Park II
2121 Crystal Drive
Arlington, VA.
Sixth Floor (Receptionist)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. V. Paul Harper whose telephone number is (703) 305-4197. The examiner can normally be reached on Monday through Friday from 8:00 a.m. to 4:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marsha D. Banks-Harold, can be reached on (703) 305-4379. The fax phone number for the Technology Center 2600 is (703) 872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service office whose telephone number is (703) 306-0377.

VPH/vph
May 23, 2003

Marsha D. Banks-Harold
SPE 2654